

CLAIMS

1. A self-attaching female fastener element, comprising:
a body portion having opposed ends and a bore extending through said
body portion through said opposed ends; and
5 a radial flange portion integral with said body portion midway between
said opposed ends having generally parallel planar annular surfaces on opposed sides
of said radial flange portion surrounding said body portion and an inwardly tapered
annular outer peripheral portion.
- 10 2. The self-attaching female fastener element as defined in Claim 1,
wherein said self-attaching female fastener element is symmetrical about a plane
perpendicular to a longitudinal axis of said bore.
- 15 3. The self-attaching female fastener element as defined in Claim 1,
wherein said body portion includes outer surfaces tapered radially outwardly from
said radial flange portion to said opposed ends.
- 20 4. The self-attaching female fastener element as defined in Claim 1,
wherein said outer peripheral portion of said radial flange portion is generally
circular.
- 25 5. The self-attaching female fastener element as defined in Claim 4,
wherein said generally parallel planar annular surfaces on opposed sides of said radial
flange portion each include a plurality of spaced radial grooves.

6. The self-attaching female fastener element as defined in Claim 5, wherein said radial grooves each include radial side walls and a bottom wall spaced below a plane of said planar annular surfaces.

5 7. The self-attaching female fastener element as defined in Claim 5, wherein said radial grooves include an end wall each spaced from said body portion.

8. The self-attaching female fastener element as defined in Claim 7, wherein said radial grooves extend to said annular outer peripheral portion of said
10 radial flange portion.

9. A self-attaching female fastener element, comprising:
a generally cylindrical body portion having opposed end portions, a bore extending through said body portion through said end portions and said end
15 portions each including a radially outwardly inclined generally frustoconical surface;
and

a radial flange portion integral with said body portion midway between said opposed end portions having generally parallel annular surfaces on opposed sides of said radial flange portion surrounding said body portion.

20

10. The self-attaching female fastener element as defined in Claim 9, wherein said self-attaching female fastener element is symmetrical about a plane perpendicular to a longitudinal axis of said bore.

11. The self-attaching female fastener element as defined in Claim 9, wherein said radial flange portion includes an inwardly tapered annular outer peripheral edge portion.

5 12. The self-attaching female fastener element as defined in Claim 9, wherein said generally parallel annular surfaces on opposed sides of said radial flange portion each include a plurality of radial grooves.

10 13. The self-attaching female fastener element as defined in Claim 12, wherein said radial grooves each include radial side walls and a bottom wall spaced below a plane of said generally planar annular surfaces.

15 14. The self-attaching female fastener element as defined in Claim 12, wherein said radial grooves are each spaced from said body portion.

 15. The self-attaching female fastener element as defined in Claim 9, wherein said radial flange portion includes a circular outer peripheral edge.

16. A method of attaching a self-attaching female fastener element to a panel, said female fastener element including a body portion having opposed end portions and a bore extending through said body portion through said opposed end portions, and a radial flange portion integral with said body portion generally midway
5 between said opposed end portions having an annular outer peripheral portion, said method comprising the following steps:

receiving one of said end portions of said body portion of said self-attaching female fastener element through an opening in a panel;

deforming said annular outer peripheral portion of said radial flange
10 portion towards said one of said end portions of said body portion thereby forming an annular groove surrounding said body portion; and

deforming an annular panel portion surrounding said opening in said panel into said annular groove.

15 17. The method of attaching a self-attaching female fastener element to a panel as defined in Claim 16, wherein said annular outer peripheral portion of said radial flange portion includes inwardly radially tapered surfaces and said method including deforming said annular outer peripheral portion of said flange portion toward said one of said end portions of said body portion until said inwardly radially
20 tapered surface adjacent said one of said end portions of said body portion extends generally perpendicular to a longitudinal axis of said bore, thereby forming an annular bearing surface supporting said panel.

18. The method of attaching a self-attaching female fastener element to a panel as defined in Claim 16, wherein each of said end portions of said body portion includes a radially outwardly inclined surface, said method including deforming said panel portion radially inwardly beneath said radially outwardly inclined surface.

5

19. The method of attaching a self-attaching female fastener element to a panel as defined in Claim 16, wherein said radial flange portion includes generally parallel annular surfaces surrounding said end portions having radial grooves, said method including deforming said panel into said radial grooves.

10

20. The method of attaching a self-attaching female fastener element to a panel as defined in Claim 16, wherein said method includes driving said one of said end portions of said body portion against said panel piercing said opening in said panel.